UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF FOSSIL ENERGY

CARBON SEQUESTRATION PROGRAM

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

PUBLIC SCOPING MEETING

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Alexandria, Virginia

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P R O C E E D I N G S

DR. BECKERT: Good evening, ladies and gentleman. For the record, I would like to begin this Public Scoping meeting for the Carbon Sequestration Program, Environmental Impact Statement. Today is the 6th of May, 2004, and the time is approximately 7:06 p.m. My name is Heino Beckert, and I am with the National Energy Technology Laboratory, and I will be conducting this Public Scoping meeting tonight.

The purpose of this meeting, as most of you know, is to receive from you important comments on the issues that are important to you and that we, that is DOE, should consider in the preparation of this Environmental Impact Statement.

If you haven't done so already, I would ask you to please sign up. There's a sign up sheet outside. You need to please sign up there, and if you do want to provide

us with comments, there's a comment sheet out there, and we would like, if at all possible, to have your comments in writing. This would greatly aid us in keeping track of comments, to make sure that nothing falls through the cracks.

I will briefly describe the NEPA process. I'll discuss the concept of the Environmental Impact Statement and a Programmatic Impact Statement, and then I will provide you with information, how to get in touch with me if you want to receive copies of the Environmental documents or if you just want to get in touch with us and ask us questions.

NEPA is the National Environmental Policy Act. For those of you who are familiar with this, I apologize, I'm sure there are some of us here that probably need a little refresher course on that. NEPA is a federal law that became law in -- became effective in 1970, and it applies to all

federal agencies. It requires that the environmental information be made available to public officials who are contemplating governmental action, and it requires that public officials make decisions based on the understanding of environmental consequences that may be a consequence of a governmental activity.

NEPA is supposed to provide us with better environmental planning, better decisions by federal officials, resulting from consideration of high quality information, accurate scientific analysis, expert agency comments, and public scrutiny. Through the Carbon Sequestration Program, DOE is directly providing resources and funding that -- for the demonstration of technologies to capture and store carbon and reduce greenhouse gas emissions, so this is a major federal activity. A major federal activity is what triggers a NEPA review. By definition, any major federal action, be it

a program or project, having the potential to significantly effect the human or natural environment, is subject to NEPA review. So our Carbon Sequestration Program with all its ramification definitely fits the definition of a major activity. It is funded by federal funds, it uses federal resources, so it definitely has to comply with the laws of NEPA.

The proposed federal action of this case is the implementation of the Carbon Sequestration Program. Scott Klara will present an overview of the Carbon Sequestration Program after I am through with my talk here. Under the proposed action, DOE would implement efforts as planned under the regional partnerships, continue to support research and development efforts for respective technologies, and it would fund commercial scale demonstration projects.

Now, these commercial scale

demonstration projects have their own NEPA review in their own right. They will not be covered in this Environmental Impact Statement. Also, I'm sure you've heard of FutureGen. You heard Scott mention it earlier and you will hear about it again tonight. FutureGen will also be considered under a separate NEPA review, it will not be covered in this Environmental Impact Statement. As I said, major federal actions require NEPA compliance, and there's no doubt that the DOE funded activities under this program must comply with NEPA. The nation-wide technology driven scope of the Carbon Sequestration activities warrants a Programmatic EIS, an EIS that covers the entire program.

The need for a broad environmental review at this time is emphasized by the plain evolution of the program from limited field testing to commercial scale demonstrations, and this is truly a major

federal activity. So what is an EIS? An EIS is a public document prepared by a federal agency or by consultants, contractors under the auspices of a federal agency to help federal officials plan the actions and make decisions.

An EIS is the highest level of review and the most formal environmental document under NEPA. There are other NEPA documents that deal with smaller projects where an environmental assessment would be called for or an even more innocuous project where there's really no chance for any adverse environmental effect, a categorial exclusion document would be prepared. But in something of the scope and the size of our program, definitely warrants a full blown EIS.

The contents, the preparation, the public availability, review, and comment procedures for an EIS are strictly mandated by law. You see on the slide here, I don't

have a laser pointer, but the contents of an EIS must include these items, and there's no getting away from that, these are legally mandated steps that must be taken. In contrast to a plain old EIS, we also have programmatic EIS's. As stated, the nation-wide technology driven scope of our DOE Carbon Sequestration Program warrants a programmatic EIS. We have a programmatic EIS to deal with the scope of our program, as you will hear from Scott, is such that there's no other way of doing that.

Each EIS must consider the proposed action and it must consider a number of alternatives. For this programmatic EIS, we expect to include the following alternatives. First, there's a no action alternative, which would mean that the program would continue at its current R&D level. Another alternative might be to modify schedules for implementation for various components of the program. There

might be variations in the mix of technologies to be employed. There also may be variations in implementation of the program dictated by peculiarities of geographic regions.

As the analysis progress, we might find out that there is a need for elimination of flawed technologies if they should be identified as such. Typically in an EIS, be it a plain old EIS or be it a programmatic one, we deal with the following subjects. We agreed on these subjects, at least for the draft document, as a result of our internal scoping. We got together and decided that these are the topics that are most likely to be effected in one way or another by the implementation of the program. The Carbon Sequestration PEIS or the Programmatic EIS will address a full range of environmental issues and potential impacts as has been identified in the Notice of Intent to prepare the EIS. This Notice

of Intent is found in your handout package. It is -- you'll recognize it. It is a copy of the Federal Register pages, and it's such -- they're pretty easy to identify.

As identified during the scoping process and exemplified by this meeting here tonight, issues and impacts that have the highest potential for significance will be identified and they will receive the greatest scrutiny and the greatest analysis in the EIS.

NEPA and the Public Scoping meeting; the purpose of this meeting is to invite comments from interested parties, be they governmental agents, representatives of governmental agencies, NGO's, the general public. You should be assured that your comments and concerns are important to us. All of your comments will be considered. DOE is now in the early stages in planning the Environmental Analysis. So at this time, it is very beneficial for us to get

your input and let us know about your environmental concerns. Now is the time, the best time for us to collect your comments and use them in our Environmental Analysis. So the Public Scoping meeting then is your opportunity to comment on the Carbon Sequestration Program as a whole, to identify issues and potential impacts that you personally or from an organizational point of view consider important. This helps steer the program and contributes to the overall decision-making process on our part.

Since this is a programmatic effort, we need to elicit public comments on a nation-wide scale, and in order to do that, we selected eight sites in the country in which to hold meetings just like this. The first one is here in the D.C. area, it's the first of the eight scoping meetings. Next week there will be one in Columbus, Ohio, and in Chicago, Illinois. After that,

it's Houston, Sacramento, Atlanta, ---- Montana, and Grand Forks, North Dakota. These meetings will be concluded by June the 10th of this year.

Some meeting logistics, the rest of this meeting will be conducted as indicated on the slide we go through this year. After I finish discussing the NEPA process, I'll introduce Scott Klara, most of you know him, of course, and he will give us a presentation on the key features of the Carbon Sequestration Program. Then the floor will be open for individuals wishing to comment on the proposed action, that is, the implementation of the Carbon Sequestration Program. We don't have a great number of people here, and I don't know how many of you will give us comments, so I don't have to invoke the five minute rule. Normally we ask that people limit their comments to five minutes. I think tonight whoever wants to speak can speak as

long as he or she is comfortable.

The commenters will be called in the order in which they signed up for making their comments outside on the sign in sheet. When you do come up to the microphone here in the center aisle and make your comments, we ask that you clearly identified yourself, give your name, perhaps spell it so that our court reporter can accurately record you.

Even though we have the court reporter present, which will help us in preparing the written transcript of this meeting, we encourage you to submit your comments also in writing, not only make oral comments, but write down your comments on the comment sheet and then we'll collect it later on. This way we are assured -- we can assure you that your comments will wind up where they should be and they won't fall through the cracks. This slide illustrates the key steps in the EIS preparation process as far as public input is concerned. You

see the -- there's a Public Scoping period before the draft EIS is developed, then we have Public Scoping meetings such as we have here, then we publish a draft EIS, there will be a public comment period on that, which will culminate in the public hearings. We take the comments that we get from the public comment period, we adjust, make changes to the draft EIS, and produce a final EIS, and the final EIS is then published.

After tonight and after the other scoping meetings are concluded, your next opportunity to review information will be following the issuance of the draft PEIS, and that will be in the summer of 2005. The final Programmatic EIS is expected to be issued in the spring of 2006.

As information about the Programmatic EIS is made available, it will be provided on the DOE Carbon Sequestration web site, which is also listed in your

handout. DOE also distributes a Carbon Sequestration newsletter. You can receive that by signing on at the web site for it or you can drop me a line and I'll see to it that you will get the newsletters sent to you.

Public hearings on the draft PEIS will be held in the same cities where the scoping meeting have been held. They will be announced when the draft PEIS is published. The notice of availability of the draft Programmatic EIS will be published in the Federal Register, and public hearing dates and public hearing locations will then be announced. They will be announced on the DOE Carbon Sequestration web site, Carbon Sequestration newsletter, newspapers in cities where the public meetings are being held, notices to federal agencies, and state agencies, and notices issued to organizations and private individuals that request that information.

The draft PEIS will be posted in text file format on the DOE web site. Paper copies will be available in libraries where the public meetings have been held. Organizations and individuals may also request paper copies of the draft EIS by letting me know. I'll see to it that you get a copy.

This slide provides my contact information which is also included in your handouts. To get any information about the Programmatic EIS, to receive answers or questions or comments, or if you want to make suggestions, please contact me. There are a number of ways of doing this. You can call a toll free number which is given here. If you can't quite read it, let me know and I'll give it to you again after the meeting. It's a toll free number. You'll call in and you can leave a recorded message. The recorded message will be transcribed, and thus be entered into the record. You can

also contact me with snail mail. My address is down here. You can call my office phone. You can send me your comments by fax, but I would not suggest that because right now we have a little -- our fax system isn't all what it should be. But you can always send me your comments by email. This is probably the best way of doing it. It helps me in categorizing your comments.

I can put them in a file, I can group them according to topics. Most importantly, I can take them as they are, by themselves or as a group, and the subject matter and transfer them to our contractors, who will -- who need those comments to do the work for us and to prepare the scoping reports.

Please note that the scoping phase for this PEIS comes to an end on June the 25th of this year. Because we have a lot of work to do to prepare the draft EIS, one year seems a long time, but it's not

when you consider the extensive review periods and all the contents we have to do. So we have to put some sort of a deadline. We have to bound this public comment period somehow, and June 25th is our -- is the deadline. Any comment that we receive from you before the deadline ends will be guaranteed to be included and considered in the preparation of the draft EIS. If we get your comments after the deadline, we'll try out best to include them, but we can't guarantee it. Of course, you have an opportunity to comment on the draft EIS when it is published, and that, as I mentioned earlier, there's a long comment period there and there will also be public hearings again. Well, this concludes my remarks. Are there any question that I could try to answer right now before we move on? Yes, sir.

MR. WILSON: What is the purpose?

DR. BECKERT: Pardon me?

MR. WILSON: What is the purpose of the program?

DR. BECKERT: The purpose of the program, I think the next speaker, Scott Klara, can give you a very precise answer to that. Does anybody else want to ask me a question now? Good. Then I would ask Scott to come up here and give us his talk on the Carbon Sequestration Program. Thank you for your attention.

MR. KLARA: Welcome. Thanks for participating in this very important event. My name is Scott Klara, I work with the U.S. Department of Energy, at the National Energy Technology Center. What I will be doing this evening is giving you an overview of the concepts of Carbon Sequestration, and more specifically, aspects related to the Carbon Sequestration within the Department of Energy. This slide provides a program overview of the various topics that will be addressed this evening. We'll first go over

some of the fossil energy situations that exist related to this issue, then address greenhouse gas implications, discuss some pathways to greenhouse gas stabilization and corresponding implications of that, then provide a sequestration overview, keeping it at a very high level at this stage, then talk about some program requirements and some structure to the program the way it currently exists, discuss some several key initiatives that are emerging from the department, the first one will be the regional partnerships, the second will be something called FutureGen, and I will complete the presentation with providing some sources of information and web site locations where you can get a tremendous amount of information regarding these issues.

I first want to go over fossil fuels and show that it's the worlds dominant energy source. The pie chart on the left

shows the United States, the pie chart on the right shows the world, and the fossil fuels cool oil and natural gas, comprise 86 percent of the energy mix for the United States, and correspondingly, 86 percent of the energy mix in the world.

The relationship of that to a greenhouse gas is that all these fossil fuels contain carbon. You burn these fuels and you produce CO2 as a consequence, a potent greenhouse gas. This chart shows, from the United States perspective, the bottom left pie chart shows that in the United States, fossil fuels like the first slide shows, provides 86 percent of the energy mix in the year 2002, and through some energy forecast projecting that out to 20/25. We see that the energy mix for fossil fuel essentially remains flat with a minor increase to 87 percent.

The more important issue that this slide shows is that the amount of energy

used in 2002 compared to 20/25 will increase by 40 percent. We show that with this number called quads, which stands for quadrillion BTU's per year. You see in 2002, it's 98, and then 20/25, it's 136. So the implications of that are that even though the fossil fuel mix stays constant and roughly 86 -- 87 percent, you're burning a lot more of it in 20/25, therefore, you would expect the amount of greenhouse gas emissions primarily CO2 to increase, as well, substantially.

I'd like to now discuss a few greenhouse gas implications. What this chart shows, the bottom axis shows hundreds of thousands of years, so this chart goes back about 200,000 years, and this shows some data, the bottom black line shows data on temperature, the upper line shows data on CO2 concentration, and what this shows is several things from historical records that the CO2 concentration and temperature rise

and fall on the planet have tracked and correlated very well. What it shows here, too, because the scales are so large, since the last 150 years or since the start of the industrial revolution, the CO2 concentrations have shot up 30 percent, and that represents this red arrow on this right hand axis where the concentrations have gone from 270 parts per million, which is the unit we use to measure this, to close to 370 parts per million by volume. So the concerns and implications to climate change are looking at this historical records and seeing how well they've correlated, what this recent increase over the last 150 years might yield.

This date is for the United States, and our program does focus primarily on the United States issues related to greenhouse gases. What this shows is that from a standpoint of global warming potential, which is the way we tend to look

at information and compare it to itself, compare it across the board from all the different greenhouse gas sources, what this shows is, over 80 percent of the greenhouse gas global warming potential comes from CO2 from energy.

Another significant piece, and I don't know how well you can see it from there, is methane, which is nine percent, and those two combined comprise about 90 percent of the total greenhouse gas and global warming potential in the United States, from anthropogenic or human produced emissions. The methane component relates to fugitive methane releases from sources like the pipeline distribution system, landfills, and coal mines.

This does have a relationship to our program in that the majority of our program, the Carbon Sequestration Program, is focusing on CO2. We have a small portion of it focusing on methane primarily related

to the emphasis and implications behind these data.

I also want to indicate, and some of this is common sense, I suspect that essentially all fossil fuels and energy sectors contribute CO2 emissions. These various pies show different sector and fossil fuel distributions. What you can see if you look at the bottom center pie, you see that all fossil fuels contribute, the most significant is oil, roughly 46 percent from the transportation sector. The other two keys are natural gas and coal, which are about 27 percent each.

I also want to focus then on the right-hand pie that shows that of the total mix, when you divide among electricity, transportation, and other, that electricity comes in at about 40 percent. The significance of this is, the majority of the greenhouse gas mitigation technologies that are coming out of the portfolio relate a lot

to coal and relate a lot to these large central emitters, which are power plants and the electricity sector. So that's the bulk of the technologies coming forward. At this time, we're really focusing on those sectors.

The intention of this graph is to show the magnitude of emission reductions that we're talking about and just how huge these are. On the left-hand axis, we have a quantity called the greenhouse gas intensity. Don't worry about the magnitude of these numbers. What the importance of this greenhouse gas intensity number, and you'll hear this used quite often is, it relates carbon emissions to GDP or economic growth. It's an excellent way to look at reducing carbon emissions while maintaining economic prosperity.

The trouble with this number scientifically is to figure out, well, what does that mean in terms of carbon emissions.

So what we've done is, we've translated it on the bottom scale, these blue lines and the right- hand axis to carbon emissions. The point I want to take away from this graph is, don't worry too much about these numbers, these are million metric tons of carbon equivalent. We're talking about billions, billions of tons of emissions. This number, what this scenario represents, what we've done is, we've done a business as usual scenario, which will be that upper line that showed there would be an increase in emissions, and then we said, what would a scenario look like if we were to stabilize U.S. emissions at 2,000 levels, and you see this bottom line shows that, shows the stabilization back at 2,000 levels. This emission gap, this huge emission gap, 1,735 million metric tons of carbon equivalent, what it would take to mitigate to get us to that stabilization level.

Just to give you a comparison of

that number, a large coal fired power plant might come in at five million metric tons, so 17,000 versus five from a large plant, this quantity is huge, and I'll show you some of the implications of that later in terms of how could we fill that gap if we were to try to mitigate those large amount of emissions.

Carbon management options, often people call us the three pillars of the stool, the three corners of the triangle. There's really three high level ways for us to look at this issue. One is to reduce carbon intensity. Examples there, renewable sources, nuclear fuel switching. The center one is to improve efficiency, both on the demand and supply side. What we mean there, for example, is, in a power plant, we're generating electricity, let's do it more efficiently. Then on the -- that would be the supply side. On the demand side would be to use a more efficient refrigerator, to

have more efficiency devices that you use around the house.

What we're here to talk about today is the third option, which is sequestering carbon. We're looking at capturing and storing anthropogenic emissions with human induced emissions, or we're looking at enhancing natural sinks to have more out-take of these emissions. This is really the key area and focus of the technologies coming out of this portfolio.

Two key presidential drivers that impact Carbon Sequestration Program and Carbon Sequestration technologies. The first one is called the National Climate Change Technology Initiative that the President announced in June of 2001. This was one of the first times where carbon sequestration was publicly announced at a high level as a third option for climate change when I showed those three legs of the stool. It also showed that, from a carbon

sequestration standpoint, the development of new technologies in this area was ever so key to solving this issue.

The second major initiative related to carbon -- impact carbon sequestration, something called the Global Climate Change Initiative, that was released on Valentine's Day in 2002. At that same time, another initiative, important initiative was released relative to criteria pollutants called the Clear Skies Initiative. So this Global Climate Change Initiative, in my view, didn't get as much presses because of the Clear Skies, but it's also ever so important.

The President again recognized the importance of carbon sequestration as ever so key to dealing with the issue of climate change. Also for the first time, the United States had a measure, a future measure to try to hit, and that measure was, when I mentioned this greenhouse gas intensity

number, which is a little difficult for many to understand, but a very nice way to look at it, the President indicated that over the next 10 years, so from 2002 to 2012, we're going to reduce this intensity by 18 percent.

That analysis I showed earlier actually hit that 2012 point and then used a speculative analysis to get us to stabilize at 2000 levels by mid century. What this initiative also indicated, that there would be a reassessment in 2012, so we're going to slow emissions to that period, and then we're going to reassess the signs at that time and set a path forward if merited by the signs. So keys to this program and the technologies coming out are to help contribute to this reduction over the next 10 years, and more importantly, have a suite of commercially available technologies ready for that 2012 reassessment. What is carbon sequestration? Simply put, it's the

capture and storage of CO2 and other greenhouse gases that would otherwise be omitted to the atmosphere. A key feature here is the permanent storage of these greenhouse gases.

Several ways you can do this; you can capture at the point of emission. An example of that would be to capture it at a large central station power plant, for example. Another way would be to absorb it from the air by plants or minerals. You can actually convert CO2 to rock. Ways of doing that would be planting ---- terrestrial applications, agriculture, et cetera, those are the two key ways.

In the first case, you know exactly where the source is because you're there capturing it; in the second case, you don't know where the molecule CO2 comes from and you don't care. Several storage locations are under consideration. Primary ones are underground reservoirs, and we have

a picture schematic here that shows several of these related to oil and gas formations, coal formations, and saline formations that contain a salty brackish water. Others is to look at increased uptake in trees, grass, the soils, or algae. All these take in CO2 for their photosynthesis, and we're looking at methods to increase the uptake there. Another option is to convert to solid materials, and there are technologies being investigated right now that can convert CO2 to essentially rock. So if I had one up here right now, it would just look like a brick. So it's as permanent storage as you can get.

The last one, which right now isn't yet considered a serious option for sequestration, is dissolved in the deep oceans. Right now the oceans are the largest natural sink. A lot of study is ongoing in our program and others, especially in the office of science which

I'll mention in a minute, looking at just understanding the mechanism, how that works, and is there any way for us to enhance that.

What's all the buzz about sequestration? In addition to it being the third leg of that stool that I mentioned, huge capacity exists. I mentioned that 1,735 million metric tons, just a huge number, well, sequestration is one of the few options where we know that huge capacity exists. What this shows is, if you look at the world emissions, and again, don't worry too much about the emissions, just the size of the bar, 6.5 gigatons, and you start looking at the high and low ranges that we know right now relative to the storage capacities, and you can even ignore ocean at this stage because it's still conceptual, you see that they're essentially a century or more worth of emission storage potential from sequestration. It's likely to be similar to how we explore for oil and gas,

the more we look, the more we'll find. But right now, these are the estimates, and it shows that there's a century or more worth of emissions capacity storage.

Back to a scenario I mentioned on that rather complicated graph with the greenhouse gas intensity and emissions gap, here's that 1,735 emissions gap. What we've done, and many people do is, they say, well, what can we use, what are the leverage we can use here to mitigate that gap.

We've divided into some several high level key areas. Some of those are the obvious ones. The bottom blue is efficiency and renewables; the yellow is forestation and agriculture, planting forest, enhancing uptake and agricultural systems, non-CO2 greenhouse gases, primarily that's the fugitive methane component I mentioned, and then two areas of sequestration that I don't need to get into here, but does talk to the sequestration.

A couple points to make from this slide are that everything is needed. These are huge emissions. We aren't coming forward and saying sequestration is the only answer, and most people aren't coming forward and saying the others are the only answer because the magnitude is too large. What this also shows is, in many scenarios being analyzed, sequestration into the year 2050 will likely have to bear the brunt of the burden, 50 -- 60 percent or more of the emissions.

Some analysis for deeper cuts beyond 2000 levels would even indicate sequestration might have to bear 80 or 90 percent of the brunt of the load to get us to a stabilization scenario. That's another reason why sequestration is ever so key these days.

What are the requirements for sequestration? Many of these are probably obvious. The requirements are, we have to

show that it's environmentally acceptable. A lot of our research is focused on proving these issues, that there's no legacy for future generations, respect, and even enhance the eco systems, it's safe, there's no sudden large discharge, and more importantly, if there's any seepage, we know how to deal with it and understand and stop it, the storage is verifiable, and also it's important that we can do it economically. So a lot of the technologies we're pursuing are looking at driving the costs of these capture and sequestration options down. What's going on with research within the Department of Energy? Sequestration at the DOE is encompassed, it circles various areas. There's an over arching function called the Climate Change Technology Program, and out of that, it really serves the coordination throughout the entire department. Then you see on the right is the Office of Science where a lot of the

basic science and fundamental research is occurring. A lot of work, for example, on ocean sequestration occurs in that bottom right box.

On the left-hand side is the Office of Fossil Energy, and this is more applied R&D. This is where our carbon sequestration research is located relative to this Programmatic Environmental Impact Statement. Also, another reason that we're focused on environmental impact is, we're also -- the technologies that are being developed and looking to actually try to be tested and deployed relative to some of these other basic areas. So that just gives you a quick snapshot within the DOE.

Now let's take a look at government-wide. A lot of research going on everywhere. Serious problem, serious issue, taken very seriously throughout these various organizations. We provided some examples here. I want to just highlight two

of them. One is, with the EPA, the Environmental Protection Agency, I mentioned that non-CO2 greenhouse gas is the fugitive methane emission. The EPA is really leading the charge in that area in terms of best practices to mitigate and reduce those emissions. The United States Department of Agriculture, very focused and strong in the area of terrestrial sequestration, both from a forestry management standpoint, but maybe even more importantly, from an agricultural standpoint. So you might hear some technologies like no till farming and things that keep more carbon stored in the soil.

Those are just two examples of very many throughout the entire government that are looking at these technology areas. Again, I would comment that the areas we're looking at in carbon sequestration are really the ones that are more large scale and field testable over the next five to ten years.

Sequestration program, we're not going into any depth in this area. We have a lot of materials you can focus on outside of here and bring back questions. We divided up into these three large bubbles. There's a core R&D portion, we see we divided up into some key areas, capture, looking at technologies to capture the CO2, sequestration, looking at all the issues relative to putting it in the ground or terrestrial sinks, break- through concepts, looking to see if there's anything we can do that can accelerate the development of these technologies, these non-CO2 greenhouse gases, the EPA has a lead on that, we work very closely with them in that area, measurement, monitoring, and verification, that's kind of a buzz term that we use to say development of tools and protocols to show that wherever we store this, it's permanent, and you can verify that.

We also have an infrastructure

piece called the regional partnerships. These partnerships are looking at a whole slew of ideas, or a whole slew of infrastructure issues. The fact is, sequestration concepts are so new that even if we had many of the issues solved, you couldn't deploy them tomorrow, and it's because of a lot of these infrastructure issues, engaging regional state and local governments, what are the kind of regulatory guidelines and regulatory aspects that deal with this, baselining sources and sinks, if sources and sinks are too far apart, extremely expensive to deal with. Those are some of the issues dealt with there.

Lastly, large scale testing, and this is a concept we call FutureGen, I'll mention that in a slide to follow. Here's showing our regional partnerships. We have 70 of these partnerships throughout the United States. These partnerships are helping us establish the infrastructure,

should wide-scale deployment of these technologies be needed. The importance also in this meeting of these locations is, when we chose the public meetings, these eight public meetings, this being the first in Washington, D.C., the other seven correlate to being within the regions of these regional partnerships because there are so many people engaged in the issues of sequestration and future deployment.

What are the regional partnerships all about? I mentioned some of this, and developing the infrastructure is really the key to those. Addressing the regulatory environmental outreach issue is the key here is that there's only so much technology can do. We can develop a technology to measure and verify, but there is some subjective decisions that go along with this like how often you have to try those technologies.

If you have a technology, for example, that could take a picture of the

reservoir, they can be expensive, and we need regional partnerships to come forward and help us with the protocols on how often we'd have to take that picture to verify permanence, establishing the protocols as similar to this permanence issue that I'm referring to.

We also want in the future phase of the partnerships to help validate some of these concepts with some small field scale efforts. These small field scale efforts will surely benefit from this Programmatic Environmental Impact Statement. Lastly, determine benefits of sequestration to a region. You might say, what do we mean by benefits, well, you can't put CO2 in a geologic formation to enhance oil recovery, we've been doing it for 35 years or more in the United States. You can also put CO2 in the ground to enhance natural gas recovery from coal beds, we've been also doing that in the United States for some time.

There are also benefits to a region in terms of terrestrial, planting trees, soil erosion, water conservation, issues such as that. So in addition to sequestration, helping to solve some of the larger climate change and greenhouse gas emissions. There are also these regional benefits that do exist in certain areas of the country.

Now, the FutureGen, one of our largest initiatives emerging from the department. What FutureGen is about is trying to get a large field scale test that we could show the latest technology to both produce electricity and hydrogen, so both power and fuel the future, and show that we can do it using coal with essentially no air pollutants. The focus from this program is to capture and permanently sequester CO2.

To give you a sense of just how large the problem is again or the issue is, when I mentioned that 1700 million metric

tons of carbon equivalent to 1700, FutureGen is one million a year, and it's still a huge endeavor. I'm going to complete the presentation here, just to show you that we have tremendous resources available, and we maintain these on a regular, if not daily, certainly a weekly basis. Here is a web site link to the carbon sequestration page, and you can essentially find almost anything you need from that page, and especially contact personnel. In addition to myself, you'll find all the key contact personnel listed in this area, as well.

On the last page, too, we have a free newsletter that we publish monthly. This newsletter is free of charge as long as you have an email address, and you could register electronically, as well, through our web site. There's also information on this page how to register, and it will provide you with a monthly very nice summary newsletter of issues merging throughout the

United States and the world relative to this area. With that, that ends my portion of the presentation, and I'll hand it back to Heino to handle it from here.

DR. BECKERT: The question arises, shall we have a 10 minute break before we start into the comments or shall we just move on? Okay. Then I need the sign in sheet or the comments sheet.

MR. GRIESHABER: No one signed up.

DR. BECKERT: It seems that nobody present has the desire to provide us with any comments at this time. So are there any other statements that somebody wants to make, any general comments, general questions? Yes.

MR. GRIESHABER: I might suggest to close the formal public meeting and send somebody here from DOE just to get some comments on what they --

DR. BECKERT: Yeah, we could do that. I could formally close the meeting,

and then we can have an offline discussion.

MS. BORGSTROM: Why don't we recess, give you the opportunity ---- I'm suggesting we recess.

DR. BECKERT: So rather than having a break, you want to --

SPEAKER: Here's your problem. If someone shows up, they know it's a two hour schedule, they may show up before the end of the second hour wanting to make a comment. If we recess, then someone shows up in the next hour, we just reopen and take their comment.

DR. BECKERT: Right. Let's do it this way. So for the record, the meeting is recessed for let's say a half an hour or so. Thank you.

(Recess)

DR. BECKERT: In five minutes we will officially close the meeting. So in five minutes, we will officially reconvene.

(Recess)

DR. BECKERT: Ladies and gentlemen, for the record, I'd like to reconvene this meeting. It is now 8:35, and the meeting is reconvened. Thank you.

Ladies and gentlemen, for the record, I would like to indicate that at 8:30 p.m. on the 6th of May, 2004, this public scoping meeting is hereby adjourned. Thank you.

(Whereupon, at 8:30 p.m., the PROCEEDINGS were adjourned.)

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